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The Changing Landscape of Multiple Myeloma: Implications for Oncology Nurses

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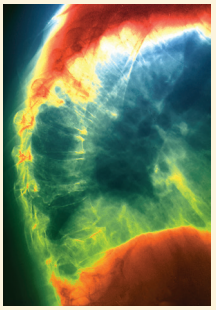

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Scientific advancements relative to diagnostic evaluation, risk-adapted treatment selection, and supportive care strategies for multiple myeloma (MM) have been developed in the past decade, which provides hope for patients living with MM. However, the disease remains incurable for the majority of patients, and continued clinical trials are necessary to refine existing therapeutic strategies and develop new approaches to treatment. Hematopoietic stem cell transplantation (HSCT), in particular autologous HSCT, remains an important component in the overall treatment paradigm for MM. This requires a well-organized team approach with ongoing communications and collaboration with community providers and other specialists. The majority of care for patients with MM is provided in the outpatient setting, relying on the active participation of both the patient and caregiver(s) for successful clinical outcomes. This supplement is prepared by members of the International Myeloma Foundation Nurse Leadership Board, which is dedicated to improving the care of patients with MM and their caregivers. The introduction serves to provide an overview of MM today and to summarize the articles included in this supplement.

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Multiple myeloma (MM) is a plasma cell neoplasm characterized by excess paraprotein secretion with secondary organ effects including renal, bone, bone marrow, neurologic, and immune dysfunction. About 22,350 new cases of MM are projected in 2013 (12,440 men, 9,910 women), with 10,710 deaths (6,070 men, 4,640 women) (Wallin & Larson, 2011). Risk factors for MM include advanced age, male gender, obesity, and African American descent (American Cancer Society [ACS], 2013; Perotta et al., 2013). The incidence of MM in 2013 in African American men was estimated at 14.4 per 100,000, more than double the 6.6 per 100,000 for Caucasian men (ACS, 2013). Similarly, African American women are more likely to develop MM compared to Caucasian women (9.8 per 100,000 versus 4.1 per 100,000). MM is listed as the 10th most common type of cancer for both African American men and women, the 10th leading cause of cancer death in men, and the seventh leading cause of cancer death in women (National Cancer Institute [NCI], 2010). The cause of the increased incidence in the African American population has not been explained and emphasizes the need for continued investigation into genetic predisposition to this disease.

Previous studies evaluating occupational exposure in MM have been limited by small sample size and variable measures for exposure to selected chemical compounds. Perotta et al. (2013) conducted a pooled analysis of five international case-controlled studies, including 1,959 patients with MM and 6,192 control participants, evaluating the association of occupational chemical exposure and the incidence of MM. Among a wide range of work categories, gardeners, plant nursery workers, and crop farmers were the most likely to be exposed to pesticides and showed a 50% increased risk of developing MM in this analysis (odds ratio [OR] = 1.5, 95% confidence interval [CI] [0.9, 2.3]). Metal processors (OR = 1.55, 95% CI [0.98, 2.35]) and women working in the housekeeping or cleaning professions (OR = 1.32, 95% CI [1, 1.76]) also showed increased risk

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Implications for Practice

- Understanding the current approach to the treatment of multiple myeloma can help oncology nurses provide optimal situations for their patients.
- Knowing the disease characteristics for multiple myeloma, smoldering myeloma, and monoclonal gammopathy of undetermined significance can aid in early detection.
- Examining the impact novel agents have had on improving survival for patients with multiple myeloma can help oncology nurses, patients, and caregivers understand possible treatment choices.

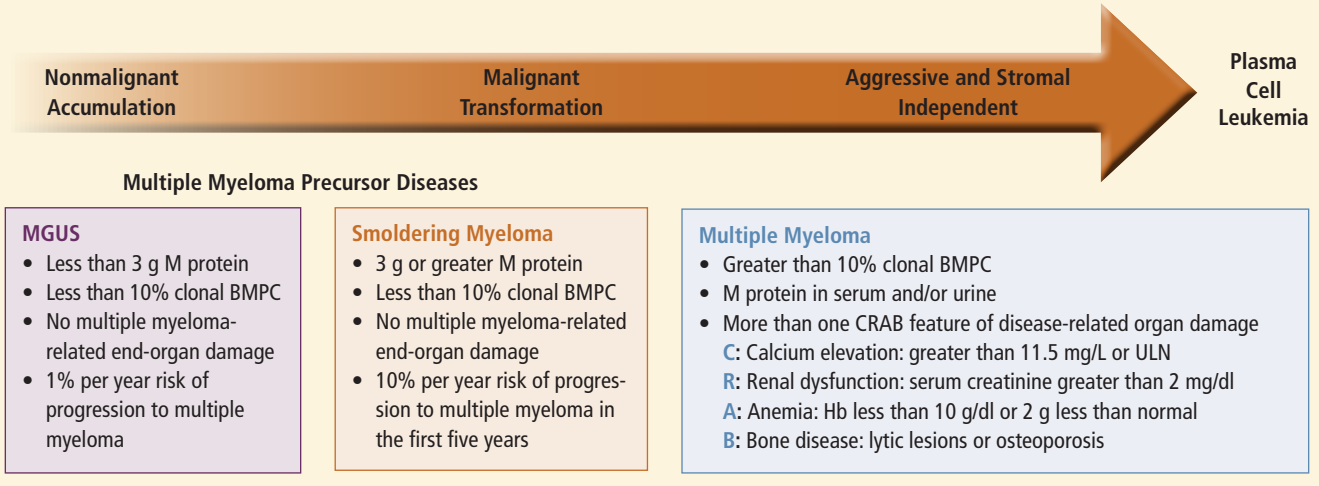
attributed to exposure to a range of potentially harmful substances such as arsenic, cadmium, lead, and various cleaning solutions. The data emphasize the need to continue efforts in identification of risk factors for MM and pursuit of opportunities to develop prevention strategies.

Disease and Treatment

The disease continuum of MM encompasses distinct clinical diagnoses, each defined by clinical and diagnostic criteria (see Figure 1). Monoclonal gammopathy of undetermined significance is an asymptomatic premalignant condition that precedes myeloma and does not require immediate treatment (Rajkumar, 2010). A 1% per year risk exists of progressing to MM; however, the overall risk of progression to MM or a related plasma cell disorder is higher in patients with higher paraprotein levels, an abnormal kappa/lambda serum-free light chain ratio, and non–immunoglobulin-G (IgG) subtypes (Agarwal & Ghobrial, 2012; Rajkumar, 2010; Rajkumar et al., 2005). Smoldering myeloma (SM) is a more advanced premalignant and asymptomatic precursor to MM with distinct clinical findings and a greater risk of progression to MM (Rajkumar, 2010). Clinical trials are ongoing to evaluate the role of disease-modifying treatment in the setting of SM.

Treatment is indicated when a patient has active MM with evidence of end-organ damage as defined by the CRAB criteria (Calcium elevation, Renal dysfunction, Anemia, and Bone disease). The overall goal for treatment of MM is a complete response, with an acceptable level of toxicity and quality of life (Palumbo & Cavallo, 2012). Achieving a complete response has been identified as a key factor in improved progression-free survival and overall survival; however, achieving a complete response does not imply eradication of the malignant clone. Survival of patients with MM has improved significantly through continued clinical investigation, the evolution of molecular and genetic profiling, novel therapies, risk-adapted treatment selection, and better supportive care (see Figures 2 and 3). Despite these advances, MM remains incurable for the majority of patients with expected relapses, each with unique clinical characteristics, patient attributes, and treatment options (Palumbo & Anderson, 2011; Siegel & Bilotti, 2009) (see Figure 4).

Autologous hematopoietic stem cell transplantation (AHSCT) remains an important treatment option for MM. Transplantation eligibility is based on well-established clinical criteria and should be considered at the time of diagnosis. Exposure to melphalan and other stem cell toxic agents must be avoided prior to stem cell collection (National Comprehensive Cancer Network [NCCN], 2013). Allogeneic HSCT remains investigational and is generally reserved for patients with higher-risk disease who have failed AHSCT and currently available novel therapies. It should only be considered within the context of a clinical trial (NCCN, 2013; NCI, 2010). The results of ongoing and future allogeneic HSCT trials will further elucidate the role of nonmyeloablative or reduced-intensity conditioning regimens in this setting.



BMPC—bone marrow plasma cells; Hb—hemoglobin; M protein—monoclonal protein; MGUS—monoclonal gammopathy of undetermined significance; ULN—upper limit of normal

Note. Based on information from Agarwal & Ghobrial, 2012; Durie et al., 2003; Kuehl & Bergsagel, 2002; Vacca & Ribatti, 2006.

FIGURE 1. Multiple Myeloma Disease Characteristics

Note. From "Laboratory Measures for the Diagnosis, Clinical Management, and Evaluation of Treatment Response in Multiple Myeloma," by S. Kurtin, 2010, *Journal of the Advanced Practitioner in Oncology, 1,* p. 201. Copyright 2010 by Harborside Press. Reprinted with permission.

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Implications for Clinical Practice

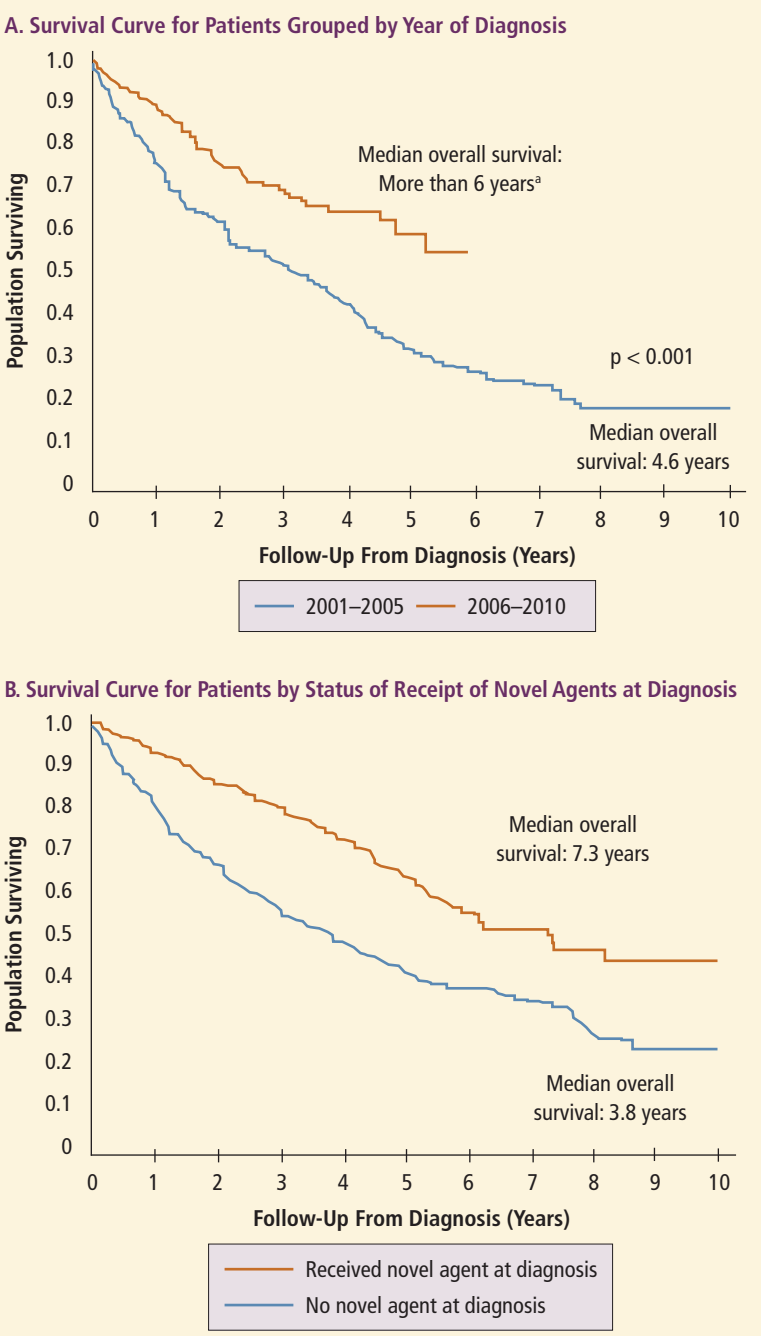
HSCT requires planning and coordination from the time a patient is considered a candidate for transplantation through the post-transplantation period. The logistics of preparation, treatment, follow-up, expected treatment-emergent adverse events, coordination of care within and between settings, financial implications, and the patient-caregiver dynamics must all be considered. The International Myeloma Foundation Nurse Leadership Board is committed to improving the lives of patients living with MM; therefore, this supplement provides a clinical guide to the care of patients with MM undergoing HSCT. The primary focus is on AHSCT. This series of articles also provides tools for forming a partnership with patients and caregivers to improve self-management capabilities and, ultimately, improve quality of life and clinical outcomes.

Miceli et al. (2013) provides a road map to AHSCT for the patient with MM. A detailed description of the role of AHSCT in the treatment of MM; eligibility criteria; and pretransplantation, peritransplantation, and post-transplantation considerations for patients, caregivers, and providers in multiple settings is offered. As previously mentioned, the patient undergoing AHSCT will receive a bulk of his or her care in the outpatient setting, and much of this will occur in the patient's community.

Clinical guidelines are included to provide the community oncology professional with tools to assist in collaborative management of patients with MM undergoing AHSCT. Given the heterogeneity of the MM population, an individualized approach to therapy is necessary, and variability in treatment approaches based on patient-specific factors is common. The article by Mangan, Gleason, and Miceli (2013) addresses the frequently asked questions pertaining to common decision points in the process of HSCT, such as: Who are good candidates for AHSCT? What is the optimal timing of an AHSCT? What is the role of allogenic-HCT in the treatment of MM? And what is the role of maintenance therapy following AHSCT?

Faiman, Miceli, Noonan and Lilleby (2013) provide an update on scientific developments pertaining to the process of HSCT relative to MM. Common preparative regimens, techniques for stem cell mobilization and collection, and management of the patient in the peritransplantation and immediate post-transplantation period are described.

The availability of a caregiver is a prerequisite to HSCT eligibility. Caregivers may include spouses or other family members, friends, or volunteers. These individuals play a critical role in the effective management of the patient prior to, during, and following an HSCT. Caregiver stress and strain are common and may have a negative effect on the quality of life of the patient and the caregiver. Kurtin, Lilleby, and Spong (2013) review key components of the caregiver role for the patient with MM, common attributes of caregiver stress or strain, and guidelines for assessment of caregiver stress. Strategies for empowering the caregiver and resources and tools to promote self-management are provided.



[a] Not yet reached

Note. Patients diagnosed from 2006–2010 are living longer than those diagnosed from 2001–2005. The majority of the survival gains were among those older than age 65 years. Novel drugs (thalidomide, bortezomib, lenalidomide) used at diagnosis helped patients live longer.

FIGURE 2. Novel Agents Improve Survival

Note. From "Continued Improvement in Survival in Multiple Myeloma and the Impact of Novel Agents" by S. Kumar, A. Dispenzieri, M. Gertz, M. Lacy, J. Lust, S. Hayman . . . S.V. Rajkumar, 2012. Retrieved from http://myeloma.org/pdfs/ASH2012_Kumar_3865.pdf. Copyright 2012 by the American Society of Hematology. Reprinted with permission.

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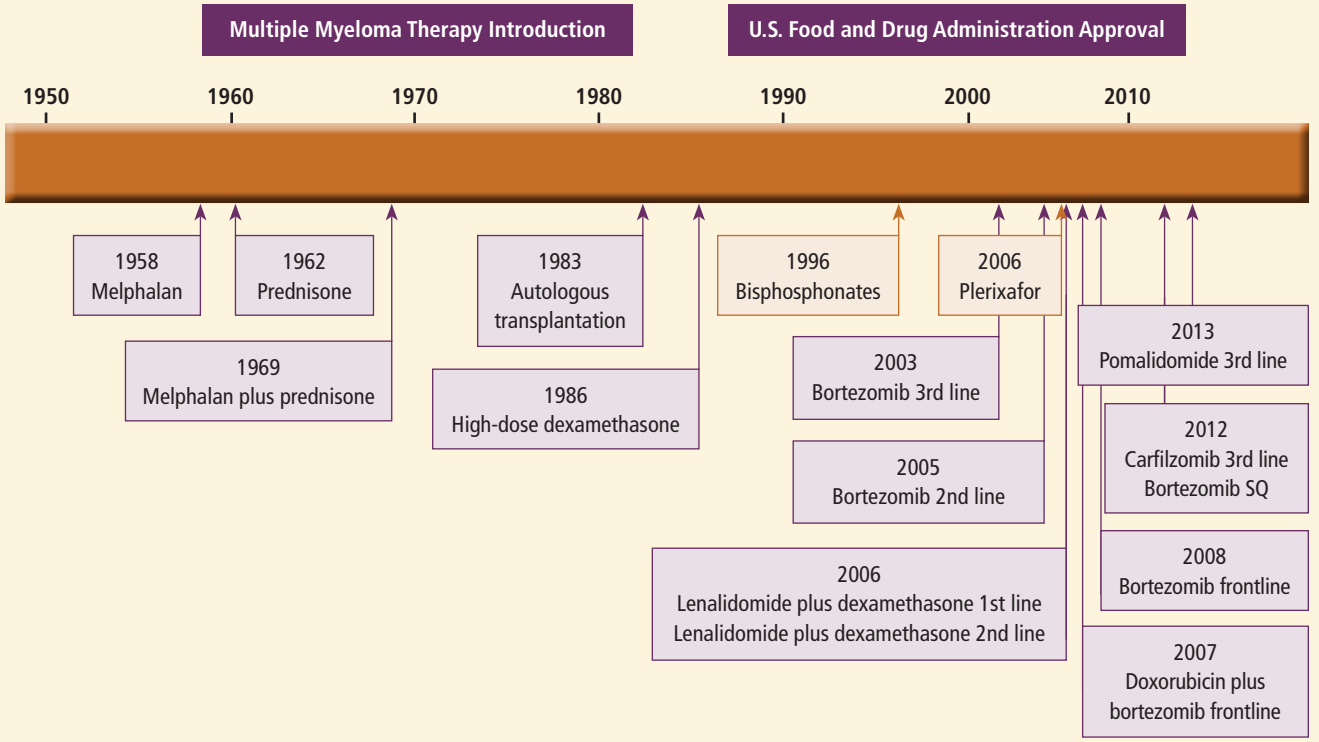


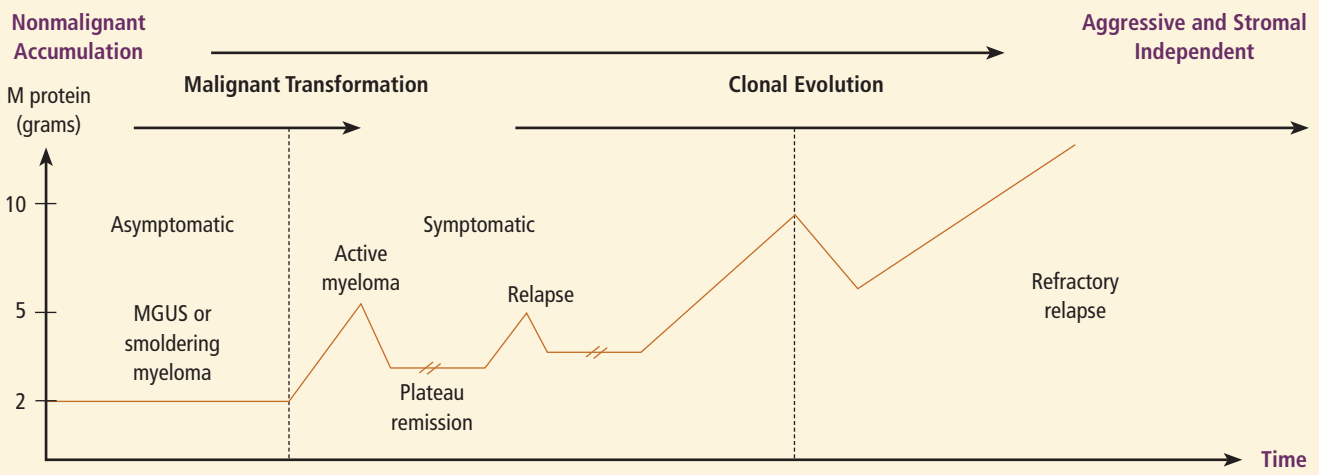
SQ—subcutaneous

Note. Bisphosphonates and plerixafor are supportive care medications. All other types listed here are treatments.

FIGURE 3. Timeline for Multiple Myeloma Drug Development

Conclusion

The scientific advances in the field of MM relative to the pathobiology of the disease, identification of potential new targets for therapy, mechanisms of resistance, and integration of new agents into the existing treatment paradigm are ongoing. Integrating these changes into clinical practice and anticipating continued developments is a challenge for the oncology professional. HSCT remains an important component of the treatment paradigm. Familiarity with eligibility criteria, pretransplantation evaluation, the actual transplantation process, and supportive care for the patient throughout the treatment continuum



M protein—monoclonal protein; MGUS—monoclonal gammopathy of undetermined significance

Note. Variable timeline dependent on individual risk factors, including genetic and phenotype changes.

Note. Based on information from Agarwal & Ghobrial, 2012; Durie et al., 2003; Kuehl & Bergsagel, 2002; Siegel & Bilotti, 2009; Vacca & Ribatti, 2006.

FIGURE 4. Multiple Myeloma Disease Trajectory and Relapse

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will improve the care of patients with MM undergoing HSCT. Integrating tools and strategies for patient and caregiver self-management as well as caregiver support will improve the active participation and quality of life for both groups. Continued engagement and collaboration with oncology professionals in support of the patient and caregiver and in robust scientific discovery will be necessary to effectively integrate these new techniques or strategies into the MM treatment and supportive care paradigm.

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